What a public procurer of innovation should know and be able to do

Considerations for curriculum development

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Abstract

Taking as the starting point the increasing interest for utilizing public procurement as a means to stimulate innovation, this paper explores some considerations for curriculum development for teaching public procurement of innovation. A basic understanding of what is a curriculum was used as a foundation for the development of a master level course in public procurement of innovation in a university setting. The course is outlined together with some examples of teaching activities included in the curriculum.

Introduction

The increasing focus on public procurement as a means to stimulate innovation seen the last decade has some implications for training of public procurers. Gone are the days when public procurement concerned only securing of supplies necessary for delivering public service, at the lowest price possible. Since the Millennium Shift and onwards, the role of public procurement as an innovation policy tool has increasingly gained attention (Edler and Georghiou, 2007; Rolfstam, 2009; Uyarra and Flanagan, 2010). This policy development raises new demand for what skills and abilities public procurers should possess in order to carry out not only conventional sourcing, but also public procurement of innovation. This development and its implications for teaching have rendered remarkably little attention among scholars, especially as one could argue that increased availability of procurement staff with specialist training in public procurement of innovation would increase the chances of success in public procurement of innovation projects. A recent Swedish public inquiry concluded also that the negligence of using public procurement an innovation policy tool, could partly be explained by the lack of available academic education on the topic (SOU, 2013). Thus, to help ameliorate this shortcoming the paper explores considerations for curriculum development for public procurement of innovation, i.e. a teaching program for public procurers of innovation.

The starting point for this exercise consists of some reflections on the process of public procurement of innovation itself. The first reflection concerns 'the project perspective'. Viewed as a project, public procurement of innovation becomes a process which involves a range of steps, starting with a need, or a problem, and ultimately ending with a new innovation being procured and diffused by the problem owner(s). The second reflection concerns 'skills', underscoring that each of these steps requires certain competences or skills. A third reflection concerns the understanding of public procurement of innovation as an endeavour affected by many different 'categories of actors'. After outlining how the curriculum notion was applied here, the paper concludes with an outline of a curriculum from a course that was developed for master students in innovation studies, the spring semester 2013. This last section covers course content, a reading list, some examples of exercises and workshops conducted as part of the curriculum.

Considerations for public procurement of innovation curriculum development

The paper is built on the assumption that public procurement of innovation teaching should in itself be seen as a change agent, essentially reflecting the recently emerging interest for the topic, and the ambition to make public procurement work as a lever for innovation. At least in the European Union public procurement as a demand-side innovation instrument were not much emphasised in the past. The last decades of the 20th Century were heavily influenced by neo-liberal ideals where public procurement policy mainly focused on efficiency, competition and the sustaining the Common market. In practise these tendencies led to procurement behaviour emphasising lowest price rather than value for money, and also unwillingness in general to engage in anything as risky as innovation projects. In this light, the current emphasis on innovation understood as a complement to efficiency is a discourse that in itself requires institutional change, if these polices are to manifest in real action (see Rolfstam, 2009 for a review).

The project perspective

One element worth accentuating lies in the difference between public procurement understood as straight rebuys and public procurement of innovation understood as a new task (Robinson et al, 1967). Straight rebuys occur in effect many times as re-use of or incrementally revised already existing expiring contracts where the interaction between the procurer and the market is relatively modest. This kind of procurement activity typically secures the sourcing of consumables and relatively well-known products, such as fuel and stationaries. Public procurement of innovation understood as a new task raises particular demands for acquiring new information and considerations of new alternatives. Viewed as an act of innovation, public procurement becomes a special case of user-producer interaction (von Hippel, 1988) where interactive learning takes place (Lundvall, 1988; Lundvall, 1992). Rather than thinking of public procurement understood as price determining auctions, public procurement becomes a development project aiming at reducing the uncertainty associated with any types of innovative activities. Compared to public procurement that takes place as straight rebuys, public procurement of innovation might require complementary skills when it comes to e.g. legal issues and project management. The project management aspects of public procurement of innovation have also been discussed in the literature (Rolfstam, 2007; Yeow and Edler, 2012). A starting point for teaching public procurement of innovation could therefore be to consider public procurement of innovation as a non-routine project, as outlined in fig 1.

Planning and preparation
Market consultation and establishing need. Assembling project team and partnerships needed to manage the process. Project definition. Selection of procurement procedure. Determination of contract award criteria.
Notification and pre-qualification (if applied)
Initial advertisement and contract notice, inviting expressions of interest. Assessment of expressions of interest. Definition of shortlist.
Tendering
Issue of tender invitations. Arranging for dealing with clarification requests from bidders. Receipt of tenders
Evaluation of bids
Formal tender opening and checks for compliance with requirements. Formal tender opening and checks for compliance with requirements. Tender evaluation of quality and price. Arranging tender presentations (if applied) Negotiating with selected tenderers (if applied). Selection of the most economically advantageous tender.
Contract Award
Notification to successful tenderer, Notification to unsuccessful tenderers
Contract Management
Monitoring that delivery meets specification, that deadlines are met.
Evaluation of procurement project
Draw lessons that might improve future procurement projects

Fig 1. Public procurement of innovation as a project (adopted from Lewis, 2003).

The generic project model for public procurement as outlined in fig 1 defines seven phases which, due to the procurement rules are sequential. It starts with a planning and preparation phase where the project is set-up. For most cases, the planning and preparation phase is the most critical in the sense that the activities that take place here often determine the outcome. Even if some organizational aspects might be adjusted later on, all aspects of the tender call need to be established at this stage. Examples of elements that typically need to be established are what tender procedure to be used, specification of what will be procured, any requirements of suppliers and the award criteria used for the selection of supplier(s).

In some situations the success of a public procurement of innovation project is also dependent on stakeholders who are not directly involved in the procurement contract, but should still be taken into consideration (Newcombe, 2003; Olander, 2007; Rolfstam, 2010a). One example is the procurement of a bio-gas and upgrading plant that took place in the Swedish town Västerås in 2001-2002. The fuel grade bio gas that came out of the process was used in buses in the region, waste collection vehicles and cars. Biogas that was not upgraded to fuel quality was used for production of electricity and heat. The residuals remaining in this process were used as high quality fertilizers

by local farmers. The system thus relied on supply of ley-crop from local farmers, and the collecting of bio-waste from local restaurants and households. As critical for the success of the system was to establish markets for the outputs the system would generate, bio-fuel to be used in vehicles, distributed heating, and fertilizers. Before commencing with the formal procurement process, the procurer secured agreements with suppliers, customers as well as legal approval from authorities (Rolfstam, 2013).

In the generic case, once the tender call has been published, the process becomes more focused on managing the project in line with the decisions made in the planning and preparations stages and in that sense a matter of administration. In situations where more dynamic forms of procurement procedures are applied, such as the competitive dialogue, the negotiated procedure or pre-commercial procurement, the situation might be different however. In most cases the contract is awarded to the bid that best corresponds to the specifications and offer the most advantageous offer. When the project enters the management stage, the contract has been awarded, and the role of the procurer becomes focused on monitoring contract compliance, and if necessary evoke and regulatory instruments written into the contract, such as issuing fines should the supplier fail to meet agreed deadlines and specifications.

Skills

A generic succes factor for public procurement of innovation projects appears to be to include staff with sufficient practical experience (Wade and Björkman, 2004). The novelty and uncertainty involved in any innovative activity makes it a cumbersome task to define more specifically what would be the necessary skills that should be adressed in a curriculum fo a course in public procurement of innovation. A set of skills that can be deduced from the project view outlined above are listed in table 1. These skills have also been derived through case study research on public procurement of innovation projects (Rolfstam, 2010b).

Skill	Description
Expertise on public procurement procedures and public procurement law	Understanding how to apply procurement procedures, award criteria
Technical competence for specification	Possess sufficient competence to know what to procure
Coordination for co-operative procurement	Coordinate the demand in projects with several customers
General project management skills	The ability to coordinate information, stick to agreed plans and meet deadlines.
Risk management	To define critical elements that need to be established before commencing
Institutional coordination	To establish agreement and acceptance from stakeholders

Table 1. A set of skills for public procurement of innovation.

The assertion made here is that a legal understanding is necessary, not as core ability for the profession, but rather as a context in which the profession is exercised in. Although a project manager in a public procurement of innovation project needs to know the legal context in which he or she operates, this does not translate to that the project manager, or the public procurer should take

the role of a lawyer. Nevertheless, it is necessary to know the procedural rules, and the relevant sources for information. It would be beneficial for a public procurer to at least be able to navigate through the legal rules applied on public procurement. Even more importantly, a capable public procurer should recognise a legal problem when they arise during a project, and as a consequence know when legal expertise needs to be brought into the project. Sometimes arguments are brought forward that certain procedures should be more useful for certain purposes than others. This is however arguments that is not easily supported in research. For instance, one recent study failed to find any evidence that the choice of procedure would determine to what extent procurement projects would encounter cost overruns, time overruns, or non-conformances (Ågren et al., 2012).

Technical competence for specification refers essentially to the ability to know what is to be procured. When promoting innovation the application of a functional specification is often stressed, i.e. the procedure where desired functions and outcomes rather than technical details of the item to be procured are given in the tender call. One should note however, that the application of functional specifications should not be regarded as a 'quick-fix' solution to uncertainty. The procurer must still have a clear understanding of the intended outcomes. This might be a more critical notion than the application of functional specification per se. As was discussed above, sometimes public procurement of innovation projects takes place as collaboration projects consisting of several stakeholders on the procurer's side with slightly different user requirements. The most critical role for procurers in such projects may not be to find the single best specification, but to arrive at a specification that would work for all stakeholders involved. This defines yet another competence requirement for the public procurer of innovation, namely the ability to co-ordinate cooperative procurement projects. The final two skills listed in table 1 concern, what sometimes in practice tend to be hard to distinguish from each other, risk management and institutional coordination. This is an issue that has given quite a lot attention in the policy discourse (Aho et al., 2006; Tsipouri et al., 2010).

One often neglected aspect of public procurement of innovation concerns what happens after the actual procurement project has been concluded, i.e. the diffusion stage. One illustrative case in point was an attempt to introduce an innovative catheter into the National Health Service (NHS) hospitals in the UK (Rolfstam et al., 2011). As summarised in table 2, a number of institutional barriers slowed down the adoption of the innovative catheter into hospital wards. The successful introduction of the catheter in the ordering systems turned out to be necessary, but still insufficient for adoption. The findings underscore the importance of incorporating these issues also in training programs for public procurers of innovation. The generic assertion that needs to be stressed is that public procurement of innovation does not end when the formal procurement procedure ends.

Institutional Barrier	**Description**	**Coordination Activity Identified in the Case**
Getting into the supply chain	A product available in existing supply systems will be favoured before products not available in existing supply systems.	Rapid Review Panel set up to evaluate solutions suggested by industry and "fast-track" into the supply chain, those found to be useful.
Organised scepticism	Clinical staff requiring a high level of proof before an innovation can be adopted.	Conduct clinical studies that confirms supplier's claims.

No technology champion	In comparison to other healthcare technologies, there appeared to be no clear champion catheters.	N/A
Decentralised decision structure	A centrally made decision to make certain technologies available may not necessarily lead to adoption in lower layers of the organisation.	Authority innovation decision. Removing existing alternative option (conventional catheter) from supply chain.
Silo budgeting	Spending and gains from spending do not affect the same budget, which removes spending incentives.	Additional funds allocated by central hospital management to cover additional cost.
Price	An innovation may be more expensive per unit (although less expensive over its lifecycle) than already existing technology.	Additional funds allocated by central hospital management to cover additional cost.
Problems with demonstrating value of innovation	Problems in showing the value of innovation (and hence justifying adoption) never tried out before in a practical setting.	Conducting long-term historical studies. Development of business case.
De -spending	Although proof supports the value of innovation the question remains what should be removed from the budget, to allow the adoption of the innovation	N/A
Existing agreements with supplier of current technology	Commitments made in current contracts prevent re-allocating of resources.	Contract clauses enabling contract termination of depreciated technology.

Table 2. Institutional barriers working against innovation adoption (adopted from Rolfstam et al., 2011).

Categories of actors

Yet another challenge that should be considered emerges in the perception of public procurement of innovation as determined by many different actors and stakeholders. Successful outcomes of public procurement of innovation projects may rely on the appropriate support from political leadership, managers, skilled procurement staff, suppliers and the adequate allocation of special competence as illustrated in fig 1. An ambition to upgrade all these specialities may not easily be transferred into one single course. The challenges for curriculum development for public procurers of innovation are therefore different from e.g. training programs for driving. The requirements for attaining a driver's license include the gaining of a variety of competences such as legal competence, practical ability to handle a car, as well as internalisation of values of safe and responsible driving. The generic ambition to achieve safe driving can however to large extent be achieved by a course targeting one generic group of students, individual drivers. The situation for public procurement of innovation is many times dependent on contributions from many layers of activities and many

different categories of stakeholders. Examples of categories affecting public procurement of innovation project outcomes are the political leadership and support for a specific project, different experts allocated to the projects, the suppliers etc. (Rolfstam, 2010b). A summary of potential roles which have an impact on public procurement of innovation projects are displayed in fig 2.

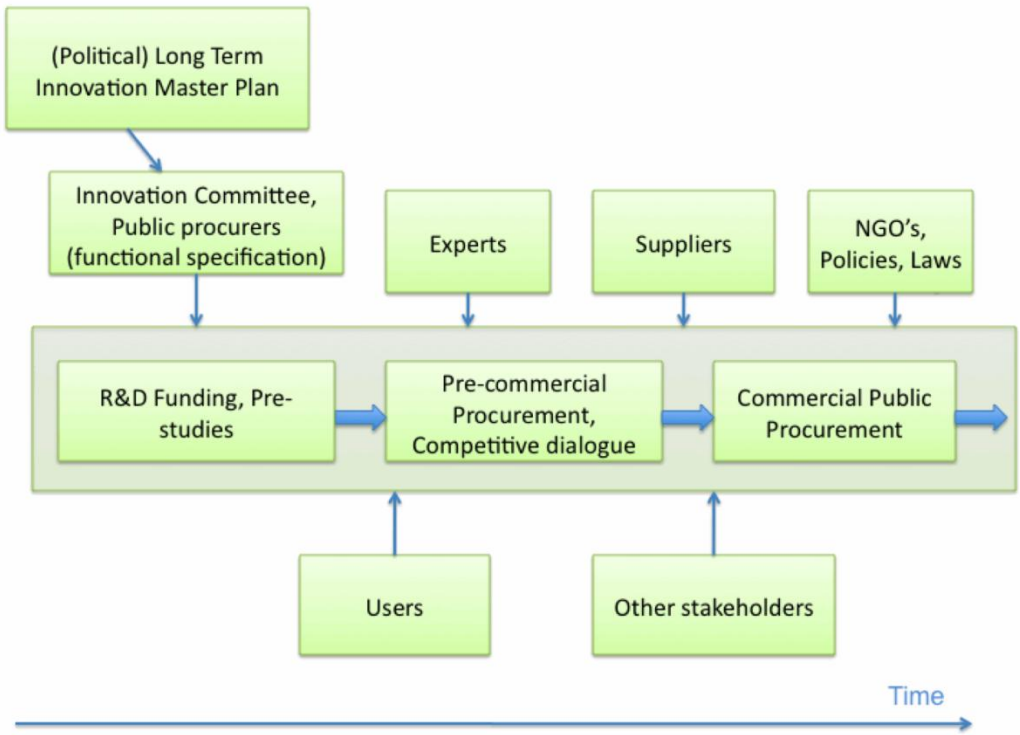


Fig. 2. Potential categories that affect public procurement of innovation projects adopted from Rolfstam, 2010b).

A curriculum for public procurers of innovation

The remaining parts of the paper describes a course called "Creating and Managing Knowledge in Public procurement of Innovation". It is an elective course rendering 5 ECTS included in the MSc Programs Innovation, Knowledge and Entrepreneurial Dynamics (MIKE-B) and Innovation, Knowledge and Economic Dynamics (MIKE-E for short) offered by Aalborg university, Denmark. Teachers in the course were Max Rolfstam, Robert Ågren and Rune Osmundsen. The course was given for the first time during the spring semester 2013. Here follows a brief discussion on some considerations made in the curriculum development, as well as practical limitations that affected the outcome. Examples of different sessions included in the curriculum are also outlined.

Assumptions on what is a curriculum

The curriculum development was based on the notion that it may refer to many things (e.g. Nygaard et. al., 2008). It may refer to the body of knowledge transmitted from the teacher to the student. The central source of such transmission is texts. Such a view reflects the listing of certain texts (typically books and journal articles) students are supposed to read, and lectures given by the

teacher aimed at facilitating learning of these texts. Knowledge in that sense refers to experience and reasoning on a subject and the ability to comprehend and make judgements on theoretical models in a subject area. Another understanding of the curriculum notion views knowledge as practise and stresses the gaining of skills. This is a form that stresses less reading, in favour of acting, and learning by doing. That aspect of the curriculum notions prompts definitions of the abilities and skills gained after completion of the course, i.e. the ability to produce a solution for a problem in a specific domain. The third aspect perceives the curriculum as defining "the product" achieved after completion of the course. The competencies captured in this aspect concern the ability to apply knowledge and skills in order to solve a given task in a given context. From a training perspective public procurement of innovation is a practice that requires all the three aspects. Some basic "book-knowledge" is required, but also management abilities one cannot easily gain through reading. Being able to reach closure by reaching a product, what in this case would correspond to a commercially procured innovation would be a very powerful outcome from a pedagogical point of view.

Delineations made

As alluded to in the first part of this paper, to delineate the boundaries of a course for public procurers of innovation is not a straight-forward task. Above was outlined some examples of relevant generic competence and skill areas, such as public procurement law, procurement procedures, and different management skills. Additional content that could be included would concern more profound understanding of innovation dynamics and theory that would deepen the strategic understanding of how, when, and when not to evoke public procurement as an innovation policy tool. Other, what could be considered as more operative issues are the role of standards and labelling, special techniques such as user-driven innovation or participatory innovation, patenting, licensing, etc. Another practical circumstance is that public procurement of innovation behaviour might be sector specific. Public procurement of innovation in health-tech may not be conducted in the same way as it occurs in the construction sector. Also, the maturity of the technology procured may be different. Special challenges that prevail in public procurement of product innovation may not prevail in process and/ or service innovation. Due to the limitations, basically determined by the length of the course, many of these aspects had to be excluded from the course curriculum. One assumption was for instance that, given the students are master students in innovation studies, some knowledge concerning innovation dynamics in general already existed.

The ideal situation would have been if the course would have included some kind of internship or interaction with real-life public procurement of innovation projects. Due to resource constraints such elements could not be included. Instead, certain simulation activities where introduced as will be discussed further below. Closely related to practise is also the product aspect of the curriculum. In an ideal world, students participating in real-life projects would potentially be given the opportunity to gain the experience of actually procuring an innovation. Instead the product aspect was satisfied through other simulation activities. In that sense were also considerations made concerning how to integrate the product aspect in the curriculum.

Outline of the course

The course outline is displayed in table 3 below. The outline consists of three basic teaching methods, Lectures (L), Workshops (WS) and Change Facilitating Exercises (CFEs). In addition, one

full day seminar called the Public Procurement of Innovation Marathon Workshop was included. The purpose of the lectures was to satisfy the theoretical requirements, the "book knowledge". The literature covered was mainly articles drawing on innovation theory dealing with public procurement of innovation. A particular focus was laid on institutional theory, as this would provide a theoretical framework for understanding changes assumed to be required in order to facilitate the development of public procurement of innovation practice. Conventional lecturing was complemented with reading exercises where students were asked to skim the literature assigned for a particular session followed by discussions.

Session	Subject	Literature
1	L1. Introduction/ Public procurement as an innovation policy instrument (part 1).	Edler and Georghiou (2007), Nonaka (1994)
2	L2. Public procurement as an innovation policy instrument (part 2).	Geroski (1990), Gregersen (1992), Rolfstam (2009), Uyarra and Flanagan (2010)
3	WS1. Strategic Game on Public Procurement of Innovation	Cooke (2004), Rolfstam (2012a)
4	CFE1. Challenging the public organisation	
5	L3. The rules and success factors of the public procurement of innovation game	Hollingsworth (2000), Searle (2005), Rolfstam (2012b),
6	L4. Public procurement law crash course	Directive 2004/17/EC, Directive 2004/18/EC, Rolfstam (2007)
7	L5. Managing Public procurement of innovation	Ågren and Landin (2012)
8	WS2. The role and impact of stakeholder rationalities	Olander (2007), Rolfstam (2013), Rolfstam et al. (2011)
9	CFE2. Challenging stakeholders	
10	L6. Public Procurement of innovation Marathon Workshop (Preparation)	Relevant literature
11	WS3. Public Procurement of innovation Marathon Workshop (Execution)	Relevant literature
12	L6. Debriefing, Summary, Exam hints	

Table 3. Outline of a course in public procurement of innovation.

Some legal texts were also covered, including the EU Directives of public procurement. One component of the lecture series was a public procurement law crash covering the formal rules on European public procurement. This was necessary in order to give an understanding of the formal procedures laid down by the European lawmakers. The intention was not to deal with specifics, such as time limits, the extent of requirements of advertisement, or other topics which can easily be

looked up in a standard handbook on public procurement. The lecture was however an opportunity to describe procedures by exemplifying how the procedures can be used to achieve public procurement of innovation. A lecture on public procurement law enables mainly learning of theoretical models, and offer relatively little in terms of the other two aspects of the curriculum notion that was applied. The practice and acting aspects were instead facilitated during the in the Public Procurement of Innovation Marathon Workshop where the ambition was to assign students with the task to develop both calls for tender by applying different procurement procedures, as well as writing bids acting as suppliers. The idea was that these documents would also count as products, i.e. function as a realisation of the product aspect of the curriculum notion applied.

The rationale for the workshops and the change facilitating exercises was mainly to evoke acting and learning by doing. The difference between these two teaching methods is best described in the difference in relation to the particular content. The workshops where more conventionally connected to the specific content of the course, while the change facilitating exercises had a stronger focus on unleashing creativity in general. The change facilitating exercises were inspired by Edward de Bono's work on "the six thinking hats". This is method of structuring collaborative problem solving and avoid destructive meetings by making participants jointly discuss one aspect of the problem to be solved at the same time. The workshops included in the curriculum are outlined below.

Public procurement of innovation as a strategic game

One of the workshops consisted of a session called "the Strategic Game on Public Procurement of Innovation" displayed in fig 3. This exercise was executed at the Ecoprocura conference in Malmö, (Rolfstam and Ågren, 2012) and also at the Participatory Innovation Conference in Sønderborg in 2011 where participants are asked to develop an innovation strategy for public procurement of innovation. The exercise involves the application of taxonomy of regional systems of innovation (Cooke, 2004) and the Hommen matrix which defines interaction modes and market effects for public procurement of innovation (Rolfstam, 2012a). Participants are asked to take on the role of a public authority and define a need to be satisfied by a public procurement of innovation project with the starting point of their understanding of the type of innovation system prevailing in their region. This is followed by discussions on potential barriers and ways to overcome these barriers. As a starting point participants were asked to draw a map of their context in which the procurement project was supposed to occur (Pic 1).

Strategic Game on Public Procurement of Innovation

1. Who are you?

2. Define your area! (Draw a map!/ Apply the Cooke taxonomy!)

Governance Dimension:

Grassroots: Locally organised technology transfer. Research competence highly applied or near market, low supra-local coordination, funding diffuse in origin.

Network: Technology transfer initiated in multilevel networks. Funding guided by agreements between banks, government agencies and firms. Research competence is mixed; both pure and applied, blue skies and near market.

Dirigiste: Technology transfer mainly animated from outside. Funding is centrally determined. Basic/fundamental research. High level of coordination, since it is state-run.

Business Innovation Dimension:

Localist: Very few or no large indigenous firms and relatively few large branches of externally controlled firms. Research reach of firms not very extensive. Few major public innovation/R&D resources, maybe smaller innovative firms.

Interactive: Domination neither by large nor small firms. Balance between private and public research institutes. Presence of larger firms' regional headquarters. Highly associated vertically and laterally, industry networks and clubs.

Globalised: Domination by global corporations, often supported by clustered supply-chains or father dependent SME's. Research reach largely internal and highly privatistic and determined by larger firms rather than public (local) needs. Innovation infrastructure aimed at helping SME's may be under development by public agencies.

	Grassroots	Network	Dirigiste
Localist			
Interactive			
Globalised			

3. The implication: What is your need/ what will you procure?

4. What kind of procurement do you envisage to make (The Hommen matrix)?

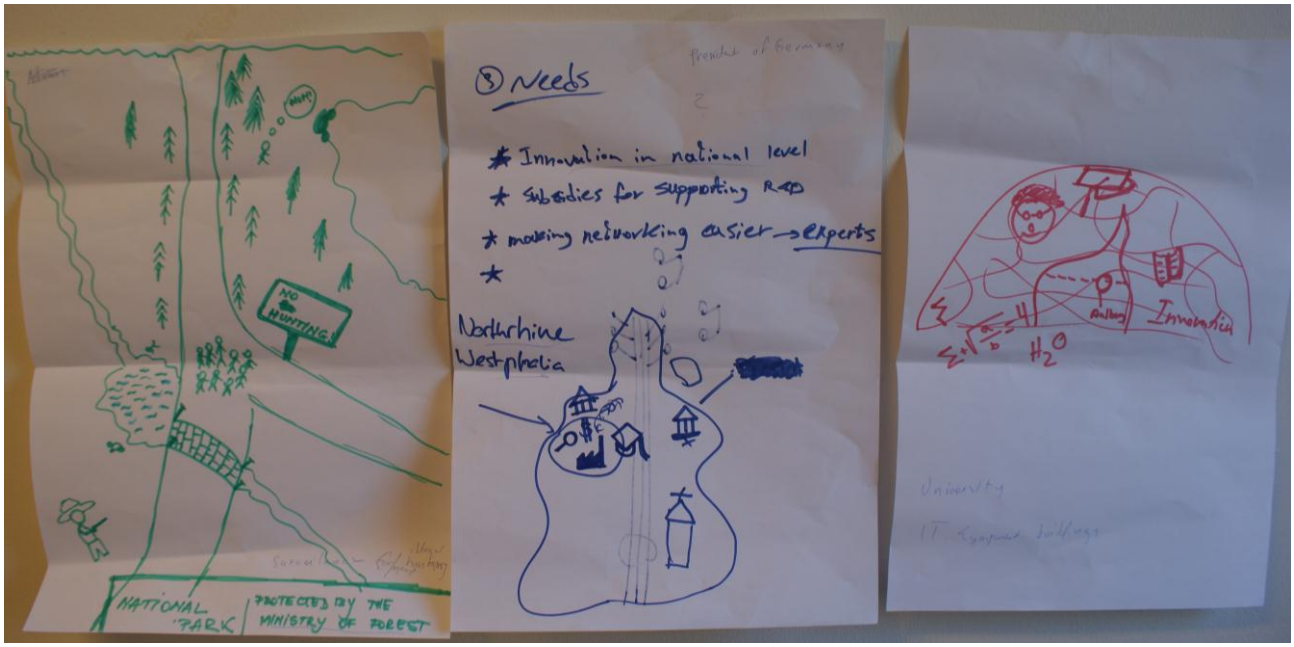
Role in Relation to Market / Type of Social Need	Initiation Development	Escalation Adaptation	Consolidation Standardisation	Destruction Removal
Direct Needs intrinsic to public agencies	Direct Initiation	Direct Escalation	Direct Consolidation	Direct Destruction
Co-operative Congeneric, or shared needs	Co-operative Initiation	Co-operative Escalation	Co-operative Consolidation	Co-operative Destruction
Catalytic Extrinsic needs to public agencies	Catalytic Initiation	Catalytic Escalation	Catalytic Consolidation	Catalytic Destruction
Distributed Need identified through exposed public opportunity	Distributed Initiation	Distributed Escalation	Distributed Consolidation	Distributed Destruction

5. What are the barriers/ problems you might encounter?

6. How would you solve/ avoid them?

References: Cooke, P. (2004). Regional Innovation Systems – an evolutionary approach. In: Cooke, Heidenreich and Braczyk (eds.): Regional Innovation Systems, p. 1-17. Routledge 2004 (17p.) - Rolfstam, M. 2012. Understanding Public Procurement of Innovation: Definitions, Innovation Types and Interaction Modes (February 28). Working paper. Available at SSRN: http://ssrn.com/abstract=2011488 or http://dx.doi.org/10.2139/ssrn.2011488.

Fig. 3. A Strategic game on public procurement of innovation.



Pic 1 Examples of maps developed by participants in the public procurement of innovation as a strategic game workshop. The maps were used as a starting point for discussions. Included examples (from left to right) were a fictive public national park, a regional system in Germany and a university.

The role and impact of stakeholders

The second workshop took as starting point, the phenomona many times occuring in public procurement of innovation projects involving different stakeholders with different rationalities (Rolfstam, 2012b). This was an enactment session that relies on the participants imagination and willingness to take on roles as different stakeholders, that draws on forum theatre. A similar exercise was conducted at the Participatory Innovation Conference in Sønderborg 2011 by the first author of this paper together with Claus Have and Vlad Stefan Wulf. The set-up was the town Smallwille and a fictive public hearing where different stakeholders were gathered to discuss a decision made by the local authorities to "build an innovative and sustainable elderly home, manned with less health staff". The roles and assigned rationalities included the local political leadership, political opposition, multinational firms, the head of fire and rescue service among other categories.

Preliminary Concluding Remarks

This paper explores considerations made in relation to an ambition to develop a curriculum for training of public procurers of innovation. It discusses some reflections made to provide a starting point for that pursuit as well as outlining a curriculum for a master level course developed in given the spring semester 2013. The course was not completed at the time for the preparation of this paper, which means that the any major conclusions could not be included here.

A preliminary reflection is that thinking in terms of 'theoretical content', 'abilities and skills', and 'product' in the light of prevailing knowledge on how public procurement of innovation occurs in practice offers useful guidance for curriculum developers. One issue that remains to be considered

concerns how a course, developed within the university setting, can be altered to fit vocational contexts, e.g. training for categories already working with public procurement. Yet another issue concerns the issue of specialisation. One potential trajectory to pursue further concerns the development of courses targeting special sectors and special tasks. The latter of these aspects will probably mean an engagement in the discussion concerning who is a public procurer. Is it the category of staff that works in public procurement units, public agency managers, the political leaderships, perhaps suppliers or any other thinkable category? The generic conclusion appears to be the point that further research is needed concerning curriculum development for public procurers of innovation.

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